

The first record of Dryadaulidae (Lepidoptera, Tineoidea) from Korea with the description of a new species, *Dryadaula koreana* sp. nov.

SEUNG JIN ROH¹, YOUNG-MIN SHIN^{2,3}, DONG-JUN LEE², BONG-KYU BYUN³

1 Department of Agricultural Biology, National Institute of Agricultural Sciences, Wanju 55365, Korea; promotionroh@korea.kr

2 Division of Forest Biodiversity, Korea National Arboretum, Pocheon 11186, Korea; ymshin89@korea.kr, newmix2@korea.kr

3 Department of Biological Science and Biotechnology, Hannam University, Daejeon 34054, Korea; bkbyun@hnu.kr

<http://zoobank.org/68F50487-56BD-4EE5-B244-DC24D8266888>

Received 28 February 2020; accepted 27 April 2020; published: 31 July 2020

Subject Editor: Jadranka Rota.

Abstract. The family Dryadaulidae Bradley is reported from Korea for the first time. In addition, a new species, *Dryadaula koreana* Roh & Byun, sp. nov. is described. All available information, including the collecting localities and illustrations of adults and genitalia are provided.

Introduction

The family Dryadaulidae consists of a single genus with approximately 50 described species (Regier et al. 2015). In the past, the subfamily Dryadaulinae was placed in the family Tineidae (Robinson 1988; Gaedike 2015). Based on a recent molecular phylogenetic study of the Tineoidea, two additional families were proposed, Dryadaulidae and Meessiidae. As a result, the superfamily Tineoidea now includes five families: Dryadaulidae, Eriocottidae, Psychidae, Tineidae, and Meessiidae (Regier et al. 2015).

The genus *Dryadaula* Meyrick, 1893, is based on the type species *Dryadaula glycinopa* Meyrick, 1893. In East Asia only two species, *Dryadaula epischista* (Meyrick, 1936) and *D. trapezoides* (Meyrick, 1935), were known, both from Japan (Sakai 2013). Regier et al. (2015) defined the family Dryadaulidae, based on the following adult characters: spatulate apical segment of labial palpi; M vein absent (M1 and M2 fused) in the hindwing; eighth abdominal sternum and genitalia of the male usually asymmetrical, right valva typically reduced and gnathos absent; female genitalia: apophyses posteriores extremely short, apophyses anteriores either vestigial or absent. The biology of most species is poorly known (Jaworski et al. 2012). Some of the larvae are mycetophagous (Gaedike 2015).

The purpose of this paper is to report the family Dryadaulidae from Korea and to describe a new species, *Dryadaula koreana* sp. nov., with the provision of the collecting localities and illustrations of adults and genitalia.

Material and methods

The material examined in this study is deposited in the Systematic Entomology Laboratory, Hannam University (SEL/HNU), Daejeon, South Korea. The genitalia were dissected using standard procedures and slide mounted in 60% euparal solution. Wing venation was examined under dry conditions. Photographs of adults were taken using a DFC 495 digital camera (Leica, Wetzlar, Germany) attached to a Leica M205A stereomicroscope (Leica, Wetzler, Germany). The holotype was collected using light traps with a mercury vapour bulb (200v/200w) and one black light bulb (FL20SbL). Besides the holotype collected in the field, other specimens in the Korea National Arboretum collections were examined. Photographs of the genitalia were taken using a Dhyana 95 scientific CMOS camera (Tucson, Fuzhou, China) attached to a Leica DM 3000 LED optical microscope (Leica, Wetzlar, Germany). Terminology of the morphological characters of the adult and male genitalia follows Robinson (1988) and wing venation and female genitalia follow Regier *et al.* (2015).

Taxonomy

Dryadaula koreana Roh & Byun, sp. nov.

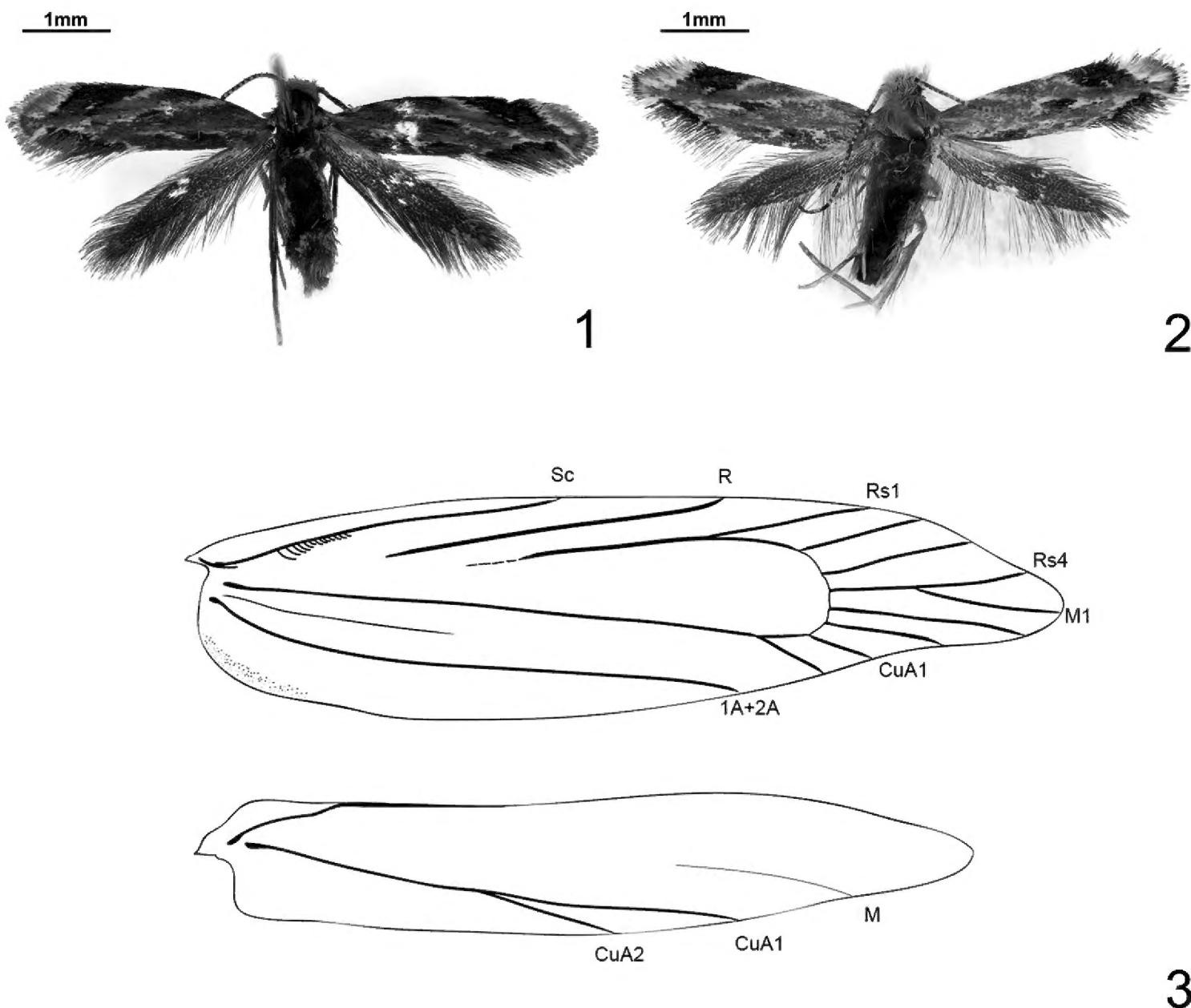
<http://zoobank.org/8A1E500F-41FA-4673-BDE7-0737FF06138B>

Material examined. Holotype: SOUTH KOREA • ♂; Jeollanam-do, Yeosu, Is. Dolsan; 34°36'N, 127°43'E; 14 June 2017; J.O. Lim, S.B. Choi, S.G. Lee, S.J. Roh leg.; genitalia No. SJ00065.

Paratypes: SOUTH KOREA • 1 ♂; Incheon, Is. Baekryeong; 37°56'N, 124°41'E; 8 July 2015; S.Y. Park, Y.M. Shin, J.W. Nam leg.; genitalia No. SJ00064 • 1 ♂; Incheon, Is. Muyi; 37°24'N, 124°24'E; 9 July 2002; Kim, Lee, Song, Kim leg.; genitalia No. SJ00061 • 1 ♀; Gangwon-do, Chuncheon; 31 July 1983; K.T. Park leg.; genitalia No. SJ00060.

Diagnosis. *Dryadaula koreana* sp. nov. is externally similar to *D. epischista* (Meyrick, 1936), but can be distinguished by the uncus of the male genitalia being elongate and slightly curved at its tip, and the right valva being rather wide, and in having three projections on the left valva. In addition, the apex of the phallus is strongly bifurcate.

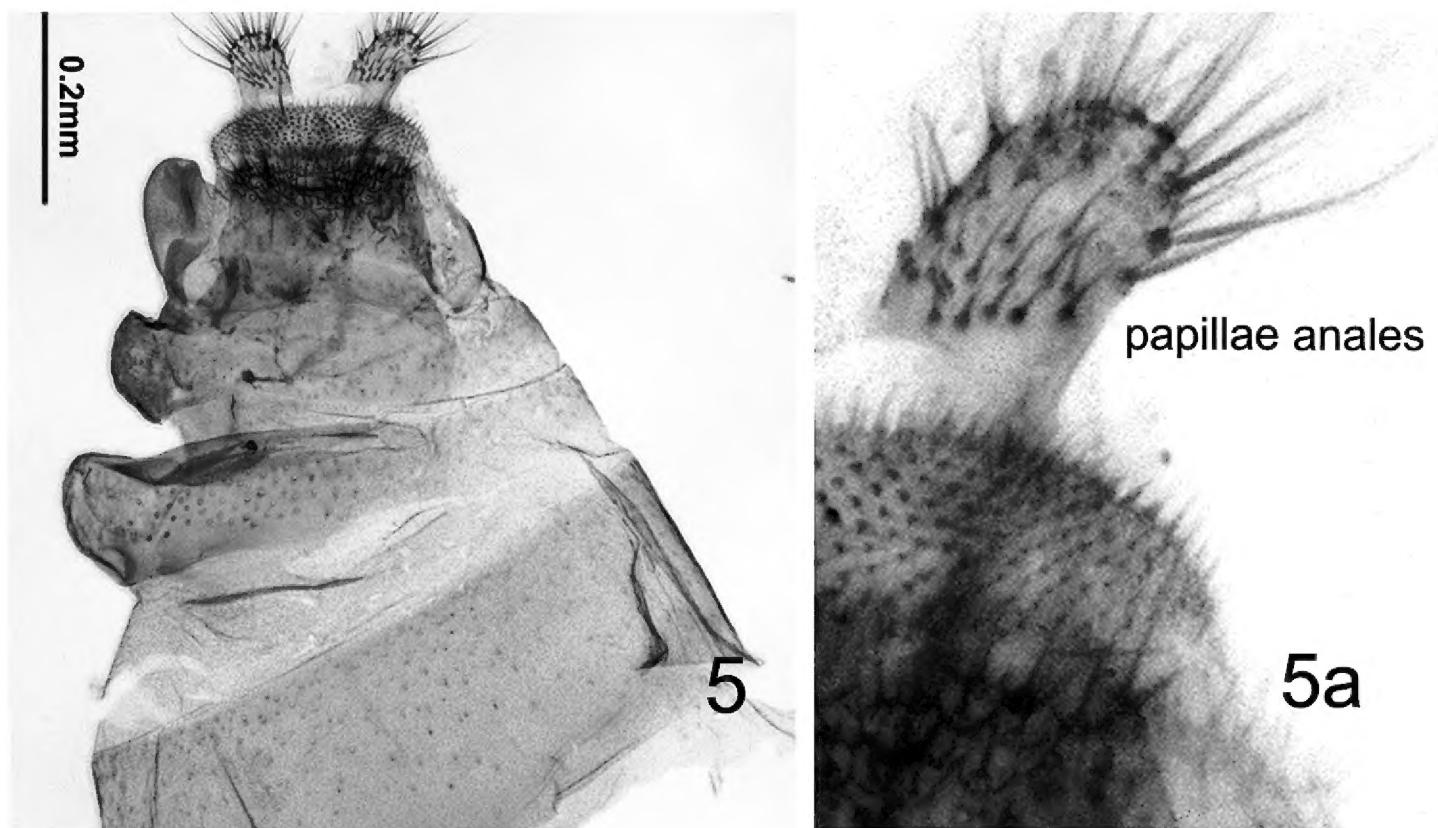
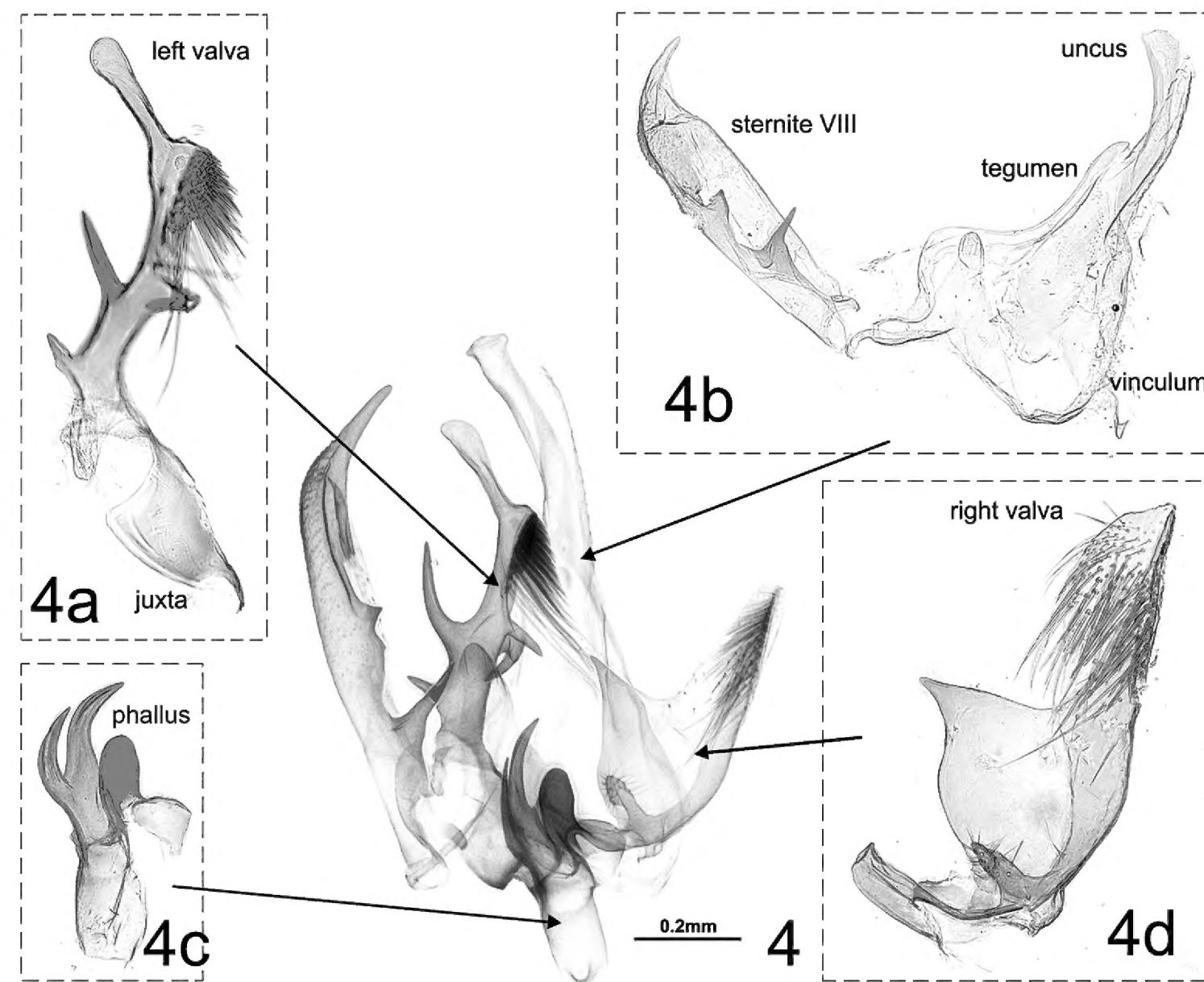
Description. Adult (Figs 1, 2). Head: small, vertex densely covered with yellow hairs; labial palpus short with yellow scales; antennae filiform, irregularly alternating dark brown and yellowish white. Thorax covered with yellowish brown scales. Legs with femora, tibiae, and tarsi covered in light yellow hairs; tarsi irregularly covered in shiny brown scales. Wingspan 6.3–7.8 mm. Forewing costa straight, gently curved beyond apex, termen short and arched to posterior margin, ground colour yellowish brown, dark brown patterned. Forewing venation (Fig. 3) length-to-width ratio of 3.74; with 10 separate veins originating at discal cell; accessory and intercalary cells absent; Sc terminating at 0.4× length of costa; M1 arising at mid-part of Rs4, reaching apex; CuP very weak, at 4/5 of costa. Hindwing costa relatively straight, apex slightly curved to termen, covered with dark brown scales; fringes long, dark brown. Hindwing venation (Fig. 3) length-to-width ratio of 5.84, all veins very weak except Sc, CuA1, and CuA2; Sc terminating at basal



Figures 1–3. Adults and wing venation. **1.** Male; **2.** Female; **3.** Wing venation.

part of costa. Abdomen covered with dark brown scales, oviscapts covered in yellowish brown scales. Male genitalia (Fig. 4) asymmetrical. Uncus (Fig. 4b) elongate and somewhat curved to tip; tegumen twisted to the left and somewhat broad, fused with vinculum; gnathos absent; right and left valva clearly asymmetrical, right valva (Fig. 4d) broad and digitate, apical part densely covered with relatively long setae, left valva (Fig. 4a) more slender than right valva and with three projections, lobate process near apical part bearing spinose setae on dorsal surface; vinculum slender; saccus blunt; juxta irregularly square and connected to left valva; phallus (Fig. 4c) strongly bifurcate at apex, tip pointed. Female genitalia (Fig. 5); sternite VIII near ostium densely covered with bristles and strongly sclerotised on right side; papillae anales (Fig. 5a) relatively slender, apical part concave with short setae; apophyses posteriores very short; ductus bursae and corpus bursae unclear.

Etymology. The species name is derived from the type locality in Korea.



Figures 4, 5. Genitalia. **4.** Male (a, left valva; b, dorsal part and sternite VIII; c, phallus; d, right valva); **5.** Female, **5a.** papillae anales

Acknowledgements

We thank R. Gaedike (Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany), for his valuable comments and information. This study was carried out with the support of the Korea National Arboretum (KNA) of the Republic of Korea (Project No. KNA1-1-20, 16-1) and the National Research Foundation of Korea (NRF) grant, funded by the Korean government (MSIT) (No. NRF-2018X1A3A1070549).

References

Chambers VT (1873) Micro-Lepidoptera. *The Canadian Entomologist* 5(6): 110–115. <https://doi.org/10.4039/Ent5110-6>

Gaedike R (2015) Tineidae I (Dryadaulinae, Hapsiferinae, Euplocaminae, Scardiinae, Nemapogoninae and Meessiinae). In: Nuß M, Karsholt O, Huemer P (Eds) *Microlepidoptera of Europe* 7. Brill, Leiden, 308 pp. <https://doi.org/10.1163/9789004289161>

Jaworski T, Plewa R, Hilszczański J (2012) First report of *Dryadaula caucasica* (Zagulajev, 1970) from Central Europe and records of further rare tineids (Lepidoptera: Tineidae) in Białowieża Primeval Forest. *Polish Journal of Entomology/Polskie Pismo Entomologiczne* 81(1): 73–79. <https://doi.org/10.2478/v10200-011-0066-4>

Meyrick E (1893) Descriptions of Australian Micro-Lepidoptera. XVI. Tineidae. *The Proceedings of the Linnean Society of New South Wales* 17: 477–612. <https://doi.org/10.5962/bhl.part.26071>

Meyrick E (1936) *Exotic Microlepidoptera* 4(20). Privately published, Marlborough, Wilts, 609–642.

Regier JC, Mitter C, Davis DR, Harrison TL, Sohn J-C, Cummings MP, Zwick A, Mitter KT (2015) A molecular phylogeny and revised classification for the oldest ditrysian moth lineages (Lepidoptera: Tineoidea), with implications for ancestral feeding habits of the mega-diverse Ditrysia. *Systematic Entomology* 40(2): 409–432. <https://doi.org/10.1111/syen.12110>

Robinson GS (1988) The systematic position of *Thermocrates epischista* Meyrick (Lepidoptera: Tineidae) and the biology of the Dryadaulinae. *Nota lepidopterologica* 11(1): 70–79.

Sakai M (2013) Tineidae. In: Hirowatari T, Nasu Y, Sakamaki Y, Kishida Y (Eds) *The Standard of Moths in Japan III: Zygaenidae, Sesiidae, Limacodidae*. Gakken Educational Publishing, Tokyo, 359 pp. [In Japanese]

Walsingham T de G (1897) Revision of the West-Indian Micro-lepidoptera, with descriptions of new species. *Proceedings of the Zoological Society of London* 1897: 54–183. <https://doi.org/10.5962/bhl.title.53759>